ABSTRACT

Flood disasters in Indonesia have shown an increase, both in magnitude and frequency. In fact, the area, depth, and duration of inundation tend to increase. Current flood control focuses on increasing river capacity: widening and/or deepening the cross-section of the river and controlling surface runoff by building storage upstream of the watershed. The storage requirement depends on the surface runoff rate in the upstream watershed.

This study aims to formulate the watershed storage volume capacity requirements, through determining the optimal watershed storage volume with the reservoir volume as a function of surface runoff.

The results of the study found that the formula for the upstream watershed storage volume (VTHD) produced a representative equation for 2 (two) river slopes, slope 0.1 with the equation $VTHD = A \times (0{,}0011\ CN^{3{,}5276})$, and slope 0.01 with the equation $VTHD = A \times (0{,}0036\ CN^{3{,}2332})$. VTHD validation was carried out in segment 3 of the Jatigede watershed (Java Island), the Jangkok watershed and the Tanggek watershed (Lombok Island), and the Jeran watershed (Sumbawa Island). effectively built/applied to watersheds with an area of less than 25 km^2 to control watershed surface runoff, by utilizing river boundaries.

Keywords: *surface runoff, increase in watershed function, storage volume, and upstream watershed.*